

SEQUENCE LISTING

<110> Ruoho, Arnold E.
Geiser, Andrew H.
Krebs, Mark
Sievert, Mike

<120> BACTERIORHODOPSIN/G PROTEIN-COUPLED RECEPTOR CHIMERAS

<130> 960296.95581

<140>

<141>

<160> 12

<170> PatentIn Ver. 2.0

<210> 1

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide

<400> 1

cgcgatatcca gtcgtgtggc

20

<210> 2

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide

<400> 2

cctcctgagg agtcgtgcca

20

<210> 3

<211> 91

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide

<400> 3

atcctgtacg tgctgttctt cgggttcacc gtcaaggagg cggcggcgca gcagcaggag 60
tcggcgacga cgcagaaggc ggagaaggag g 91

SEQUENCE LISTING

<110> Ruoho, Arnold E.
Geiser, Andrew H.
Krebs, Mark
Sievert, Mike

<120> BACTERIORHODOPSIN/G PROTEIN-COUPLED RECEPTOR CHIMERAS

<130> 960296.95581

<140>

<141>

<150> 60/098950

<151> 1998-09-03

<160> 53

<170> PatentIn Ver. 2.0

<210> 1

<211> 1626

<212> DNA

<213> Halobacterium salinarium

<220>

<221> CDS

<222> (394)..(1182)

<400> 1

```

ggatccgacg tgaagatggg gctcccgatg ggtgcaaccg tgaagtccgt cacggctgcg 60
tcacgacagg agccgaccag cgacaccag aaggtgcgaa cggttgagtg ccgcaacgat 120
cacgagtttt tcgtgcgctt cgagtggtaa cacgcgtgca cgcacgact tcaccgcggg 180
tgtttcgacg ccagccggcc gttgaaccag caggcagcgg gcatttcaca gccgctgtgg 240
cccacacact cgggtgggggtg cgctattttg gtatggtttg gaatccgcgt gtcggctccg 300
tgtctgacgg ttcacggtc taaattccgt cagcagcgta ccatactgat tgggtcgtag 360
agttacacac atatcctcgt taggtactgt tgc atg ttg gag tta ttg cca aca 414
                                Met Leu Glu Leu Leu Pro Thr
                                1                                5

gca gtg gag ggg gta tcg cag gcc cag atc acc gga cgt ccg gag tgg 462
Ala Val Glu Gly Val Ser Gln Ala Gln Ile Thr Gly Arg Pro Glu Trp
      10                      15                      20

```

atc	tgg	cta	gcg	ctc	ggg	acg	gcg	cta	atg	gga	ctc	ggg	acg	ctc	tat	510
Ile	Trp	Leu	Ala	Leu	Gly	Thr	Ala	Leu	Met	Gly	Leu	Gly	Thr	Leu	Tyr	
25						30					35					
ttc	ctc	gtg	aaa	ggg	atg	ggc	gtc	tcg	gac	cca	gat	gca	aag	aaa	ttc	558
Phe	Leu	Val	Lys	Gly	Met	Gly	Val	Ser	Asp	Pro	Asp	Ala	Lys	Lys	Phe	
40					45					50					55	
tac	gcc	atc	acg	acg	ctc	gtc	cca	gcc	atc	gcg	ttc	acg	atg	tac	ctc	606
Tyr	Ala	Ile	Thr	Thr	Leu	Val	Pro	Ala	Ile	Ala	Phe	Thr	Met	Tyr	Leu	
				60					65					70		
tcg	atg	ctg	ctg	ggg	tat	ggc	ctc	aca	atg	gta	ccg	ttc	ggg	ggg	gag	654
Ser	Met	Leu	Leu	Gly	Tyr	Gly	Leu	Thr	Met	Val	Pro	Phe	Gly	Gly	Glu	
			75					80					85			
cag	aac	ccc	atc	tac	tgg	gcg	cgg	tac	gct	gac	tgg	ctg	ttc	acc	acg	702
Gln	Asn	Pro	Ile	Tyr	Trp	Ala	Arg	Tyr	Ala	Asp	Trp	Leu	Phe	Thr	Thr	
	90					95						100				
ccg	ctg	ttg	ttg	tta	gac	ctc	gcg	ttg	ctc	gtt	gac	gcg	gat	cag	gga	750
Pro	Leu	Leu	Leu	Leu	Asp	Leu	Ala	Leu	Leu	Val	Asp	Ala	Asp	Gln	Gly	
105						110					115					
acg	atc	ctt	gcg	ctc	gtc	ggg	gcc	gac	ggc	atc	atg	atc	ggg	acc	ggc	798
Thr	Ile	Leu	Ala	Leu	Val	Gly	Ala	Asp	Gly	Ile	Met	Ile	Gly	Thr	Gly	
120					125					130					135	
ctg	gtc	ggc	gca	ctg	acg	aag	gtc	tac	tcg	tac	cgc	ttc	gtg	tgg	tgg	846
Leu	Val	Gly	Ala	Leu	Thr	Lys	Val	Tyr	Ser	Tyr	Arg	Phe	Val	Trp	Trp	
				140					145					150		
gcg	atc	agc	acc	gca	gcg	atg	ctg	tac	atc	ctg	tac	gtg	ctg	ttc	ttc	894
Ala	Ile	Ser	Thr	Ala	Ala	Met	Leu	Tyr	Ile	Leu	Tyr	Val	Leu	Phe	Phe	
			155					160					165			
ggg	ttc	acc	tcg	aag	gcc	gaa	agc	atg	cgc	ccc	gag	gtc	gca	tcc	acg	942
Gly	Phe	Thr	Ser	Lys	Ala	Glu	Ser	Met	Arg	Pro	Glu	Val	Ala	Ser	Thr	
		170					175					180				
ttc	aaa	gta	ctg	cgt	aac	gtt	acc	gtt	gtg	ttg	tgg	tcc	gcg	tat	ccc	990
Phe	Lys	Val	Leu	Arg	Asn	Val	Thr	Val	Val	Leu	Trp	Ser	Ala	Tyr	Pro	
185						190					195					
gtc	gtg	tgg	ctg	atc	ggc	agc	gaa	ggg	gcg	gga	atc	gtg	ccg	ctg	aac	1038
Val	Val	Trp	Leu	Ile	Gly	Ser	Glu	Gly	Ala	Gly	Ile	Val	Pro	Leu	Asn	
200					205					210					215	
atc	gag	acg	ctg	ctg	ttc	atg	gtg	ctt	gac	gtg	agc	gcg	aag	gtc	ggc	1086
Ile	Glu	Thr	Leu	Leu	Phe	Met	Val	Leu	Asp	Val	Ser	Ala	Lys	Val	Gly	
				220												

<210> 6
<211> 96
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 6
cgggatacgc ggaccacaac acaacggtaa cgttacgcag tactttgaac gtggatgcga 60
cctccatgcg cgtgacctcc ttctccgcct tctgcg 96

<210> 7
<211> 26
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 7
gtacatcctg tacgtgctgt tcttcg 26

<210> 8
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 8
acgacgggat acgcggacc 19

<210> 9
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 9
atcctgtacg tgctgttctt cg 22

<210> 10
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 10
cgggatacgc ggacc

15

<210> 11
<211> 83
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 11
atcctgtacg tgctgttctt cgggttcacc gcgcgctccc acacgcgcaa gatctccacg 60
ctcccgcgcg cgaacatgaa ggg 83

<210> 12
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 12
cgggatacgc ggaccacaac acaacggtaa cgttacgcag tactttgaac gtggatgcga 60
cgcccttcat gttcg 75

<210> 13
<211> 89
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 13
gggttcaccg aggtcttcta cctcatccgc aagcagctga caagaaggtc tccgcgtcct 60
ccggcgaccc gcagaagtac tacggcaag 89

<210> 14
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 14

cacaacggta acgttacgca gtactttgaa cgtggatgcg acggacttcg cgatcttgag 60

ctccttgccg tagtacttct gcgggtcgcc 90

<210> 15

<211> 84

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 15

gggttcaccg gccagctcgt cttcacggtc aaggaggcgg cggcgagca gcaggagtcg 60

gcgacgacgc agaaggcgga gaag 84

<210> 16

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 16

ggaccacaac acaacggtaa cgttacgcag tactttgaac gtggatgcga cgcggctgac 60

ctccttctcc gccttctgcg tcgtcgccga 90

<210> 17

<211> 68

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 17

tttgtacatg tacatcctgt acgtgctgtt cttcgggttc acccagctcg tcttcacggt 60

caaggagg 68

<210> 18

<211> 100

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 18
gctgccgatac agccacacga ctggatacgc ggaccacaac acaacggtaa cgttacgcag 60
tactttgaac gtggatgcga ccatgcgcgt gacctccttc 100

<210> 19
<211> 74
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 19
ttgtacatg tacatcctgt acgtgctgtt cttcgggttc acctacggcc agctcgtctt 60
cacggtcaag gagg 74

<210> 20
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 20
gctgccgatac agccacacga ctggatacgc ggaccacaac acaacggtaa cgttacgcag 60
tactttgaac gtggatgcga ccgtgacctc cttctccgcc 100

<210> 21
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 21
gtacatcctg tacgtgctgt tcttcgggtt caccggc 37

<210> 22
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 22
atcctgtacg tgctgttctt cgggttcacc ggc 33

<210> 23
<211> 31
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 23

acgacgggat acgcggaacca caacacaacg g

31

<210> 24

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 24

cgggatacgc ggaccacaac acaacgg

27

<210> 25

<211> 93

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:chimeric loop 3
sequence

<220>

<221> CDS

<222> (1)..(93)

<400> 25

acc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag gag 48
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Glu
1 5 10 15

tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc atg gtc 93
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val
20 25 30

<210> 26

<211> 31

<212> PRT

<213> Artificial Sequence

<400> 26

Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Glu Glu
1 5 10 15

Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val
20 25 30

[illegible]

```
<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence
```

```
<210> 28
<211> 31
<212> PRT
<213> Artificial Sequence
```

```
<210> 29
<211> 99
<212> DNA
<213> Artificial Sequence
```

```
<220>
<221> CDS
<222> (1) .. (99)
```

<400> 29																
acc	tac	ggc	cag	ctc	gtc	ttc	acg	gtc	aag	gag	gcg	gcg	gcg	cag	cag	48
Thr	Tyr	Gly	Gln	Leu	Val	Phe	Thr	Val	Lys	Glu	Ala	Ala	Ala	Gln	Gln	
1				5				10				15				
cag	gag	tcg	gcg	acg	acg	cag	aag	gcg	gag	aag	gag	gtc	acg	cgc	atg	96
Gln	Glu	Ser	Ala	Thr	Thr	Gln	Lys	Ala	Glu	Lys	Glu	Val	Thr	Arg	Met	
20				25				30								

```
gtc                                     99
Val
```

<210> 30
<211> 33
<212> PRT
<213> Artificial Sequence

<400> 30
Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15
Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met
20 25 30

Val

<210> 31
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(90)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 31
acc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag gag 48
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
tcg gcg acg acg cag aag gcg gag aag gag gtc acg gtc 87
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25

<210> 32
<211> 29
<212> PRT
<213> Artificial Sequence

<400> 32
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25

<210> 33
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(96)

<220>

<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 33

acc ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag	48
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc atg gtc	96
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val	
20 25 30	

<210> 34

<211> 32

<212> PRT

<213> Artificial Sequence

<400> 34

Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val	
20 25 30	

<210> 35

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

<222> (1)..(90)

<220>

<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 35

acc ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag	48
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg gtc	90
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val	
20 25 30	

<210> 36

<211> 30

<212> PRT

<213> Artificial Sequence

<400> 36

Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
 20 25 30

<210> 37
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> CDS
 <222> (1)..(96)

<220>
 <223> Description of Artificial Sequence:chimeric loop 3
 sequence

<400> 37
 acc tac ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag 48
 Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
 1 5 10 15
 cag gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 96
 Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
 20 25 30

<210> 38
 <211> 32
 <212> PRT
 <213> Artificial Sequence

<400> 38
 Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
 1 5 10 15
 Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
 20 25 30

<210> 39
 <211> 90
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> CDS
 <222> (1)..(90)

<220>
 <223> Description of Artificial Sequence:chimeric loop 3
 sequence

<400> 39
 acc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag gag 48
 Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Glu
 1 5 10 15
 tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 90
 Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
 20 25 30

<210> 40
<211> 30
<212> PRT
<213> Artificial Sequence

<400> 40
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 41
<211> 93
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(93)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 41
acc ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag 48
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln
1 5 10 15
gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 93
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 42
<211> 31
<212> PRT
<213> Artificial Sequence

<400> 42
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln
1 5 10 15
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 43
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: high affinity
analog

<400> 43
Val Leu Glu Asp Leu Lys Ser Cys Gly Leu Phe Gly
1 5 10

seqs="seqs"

<210> 44
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random peptide

<400> 44

Ser Ser Val Phe Leu Val Val Asp Arg Ser Arg
 1 5 10

<210> 45

<211> 91

<212> DNA

<213> Halobacterium salinarium

<400> 45

cctgcagggt cgctggactc atccacctca gcattcaccc tgctctttgg tgtgctactc 60

gttctatgac accctcggac caatactggc t 91

<210> 46

<211> 266

<212> DNA

<213> human

<220>

<221> CDS

<222> (2)..(265)

<400> 46

g tac atc ctg tac gtg ctg ttc ttc ggg ttc acc cgc gtc ttc cag gag 49
 Tyr Ile Leu Tyr Val Leu Phe Phe Gly Phe Thr Arg Val Phe Gln Glu
 1 5 10 15

gcg aag cgc cag ctc cag aag atc gac aag tcc gag ggc cgc ttc cac 97
 Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe His
 20 25 30

gtc cag aac ctc tcc cag gtc gag cag gac ggc cgc acc ggc cac ggc 145
 Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His Gly
 35 40 45

ctc cgc cgc tcc tcc aag ttc tgc ctc aag gag cac aag gcg ctc aag 193
 Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu Lys
 50 55 60

acc ctc gag gtc gca tcc acg ttc aaa gta ctg cgt aac gtt acc gtt 241
 Thr Leu Glu Val Ala Ser Thr Phe Lys Val Leu Arg Asn Val Thr Val
 65 70 75 80

gtg ttg tgg tcc gcg tat ccc tcg t 266
 Val Leu Trp Ser Ala Tyr Pro Ser
 85

CCCTGAGGCTCGCTGGACTCATCCACCTCAGCATTCACTCTCTTTGGTGTGCTACTCGTTCTATGACACCCTCGGACCAATACTGGCT

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 50

tgtacatgta catcctgtac gtgc

24

<210> 51

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 51

atcctgtacg tgctgttctt cgggttcacc cgcgtcttcc aggaggcgaa gcgccagctc 60

cagaagatcg acaagtccga gggccgcttc

90

<210> 52

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 52

aagcgccagc tccagaagat cgacaagtcc gagggccgct tccacgtcca gaacctctcc 60

caggtcgagc aggacggccg caccggccac

90

<210> 53

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 53

gctgccgatc agccacacga ctggatacgc ggacc

35

Sequence:oligonucleotide

Sub
a1
cont